The Province of Alberta

PETROLEUM AND NATURAL GAS CONSERVATION BOARD

Application for Permission to Remove or cause to be removed Natural Gas from the Province of Alberta, under the Provisions of the Gas Resources Preservation Act by ~~Prairie Pipe Lines Limited~~ McColl-Frontenac & Union Oil of California.

I. N. McKinnon Esq., Chairman

D. P. Goodall Esq.

Dr. G. W. Govier

Session: December 4th, 1950.

Volume 1.

I N D E X

VOLUME 1.

4th December, 1950.

W I T N E S S E S

E X H I B I T S

- ...

THE PROVINCE OF ALBERTA

PETROLEUM AND NATURAL GAS CONSERVATION BOARD

In the Matter of The Gas Resources Preservation Act

- and -

In the Matter of The Application of McColl-Frontenac Oil Company Limited and Union Oil Company of California for a Permit to Remove or Cause to be Removed Gas from the Province for Use and Consumption Within The State of Montana in the United States of America.

.....

Commencement of Hearing at the Court House, Calgary, on the 4th day of December, A.D. 1950.

MR. J. E. A. MACLEOD, Esq., K. C.: Mr. Chairman and Gentlemen, I have filed the Notice of Publication with the Board by letter on November 5th. We propose, in addition to the evidence which went in on the Joint Commission, to submit evidence by Dr. Hugh Beach, going into more detail as to the reserves of the Pakowki Lake area and also giving some other particulars as to the wells drilled and the investment in that field. That will be followed with evidence submitted by Mr. J. E. Corette, Jr., Vice President of the Montana Power Company, giving certain details of that company, its organization and the field which it fills in Montana, and some general evidence as to the need of the gas in Montana, which we are asking to export. That will be followed by Dr. Eugene S. Perry, head of the geological department of the University of Montana at Butte, or the School of Mines, I beg pardon, at Butte, going more particularly into the gas reserves of Montana. I will call first Dr. Beach.

HUGH H. BEACH, having been duly sworn, examined by Mr. Macleod, testified as follows:-

MR. MACLEOD: I imagine you do not want to hear anything further about Dr. Beach's qualifications?

THE CHAIRMAN: Oh, no.

Q MR. MACLEOD: Dr. Beach, you have prepared a submission as to the gas reserves in the Pakowki Lake area?

A That is correct.

Q And various other matters that are relevant to this hearing?

A Yes.

Q THE CHAIRMAN: Is there any necessity of reading all this in detail, Mr. Beach?

A I do not believe so, sir.

Q It is essentially the same as was previously presented?

A Yes, sir, it is essentially the same as we previously presented and the only pertinent new information is we have included the wells that were drilling at the time of our last testimony.

MR. C. E. SMITH: Is this a new submission this morning?

MR. MACLEOD: Yes. There are three of them, as a matter of fact.

MR. C. E. SMITH: I have not got one. I do not know whether the rest of the people have one or not.

DR. BEACH'S SUBMISSION AND EXHIBITS THERETO NOW MARKED EXHIBIT 1.

Q DR. GOVIER: I take it this is essentially a revision of your previous Exhibit J-11?

A Yes, that is correct. J-11.

THE CHAIRMAN: Mr. Beach, is this not more a revision of the original application rather than J-11? I have just glanced at this and you do not go into the reserves of the whole Province?

A It is more specifically a revision of the original application and the data on that rather than J-11.

Q You have not gone into detail, as you did in J-11, into the reserves of the whole Province?

A That is right. There is nothing in this about the reserves of the Province, other than the Pendant d'Oreille area.

Q Will you proceed then, Mr. Beach?

A I think there are two matters of interest in this particular report, that is, the drilling of an additional well at Manyberries at the North end of the field, which has proved gas-bearing and has expanded the reserves of that field so that at the present time we regard the reserves of the Manyberries field at 117 billion cubic feet in place, recoverable to 100 pounds p.s.i. abandonment pressure, 105.5, and net marketable gas measured at 14.4 p.s.i.a. 100.3. That was brought about by the drilling of an additional well shown on the map following page 8, and the well is 6D-2-6-6.

Q MR. C. E. SMITH: What is that again? What was the number?

A It is Number 6D-2-6-6. It is in Township 6, Range 6, West of the 4th. It appears on the map following page 8 of the submission.

Q That does not appear on the original map that was with the application, does it?

A Not with the original application, no, sir. That well was spudded in on September 9th, 1950 and completed as a gas well on September 29th, 1950, at a total depth of 2,685 feet.

The other point of interest is the drilling of a second well at the Smith Coulee field.

MR. GOODALL: What page is that on?

A The data is on page 9 and the map is on the following page. And the well to which I refer is 6D-20-3-10 in Township 3, Range 10. Inasmuch as this well came in as a productive gas well, with essentially the same characteristics as our first Smith Coulee well, we have regarded it as a field extension and from it make an estimate of the reserves at the present time of the Smith Coulee field at 22 billion cubic feet of gas in place, 19 billion recoverable to 100 pounds p.s.i.a. abandonment and 18 billion net gas marketable. Our present concept of the reserves within our holdings in that area are summarized on Page 4. I believe that is all that can be considered new in our testimony.

Q MR. MACLEOD: Dr. Beach, before we leave these reserves there is one thing, I think there is an error, a typographical error on page 5, where you speak of the computation of the reserves in the Pendant d'Oreille, Manyberries and Smith Coulee fields. Did you intend to include Black Butte there?

A I believe that is correct, yes. Yes, in this formula for computing the reservoir pressure the Black Butte area is included as well on page 5.

MR. C.E. SMITH: I do not follow that. Is there a

correction or not?

MR. MACLEOD: Yes, on page 5, Mr. Smith, where Dr. Beach states the formula, he dealt only with the Pendant d'Oreille, Manyberries and Smith Coulee and omitted Black Butte which should be included.

(Go to Page 6.)

Q Dr. Beach, beginning at the bottom of page 2 you deal with wells drilled and their costs.

A Yes.

Q What have you to say about that?

A These are data provided by our accounting department of the moneys that we have spent in this area in the development of our present gas reserves and the exploration necessary to arrive at these reserves. They are listed as to the number of wells drilled each year and the total expenditures for each year. In 1950 it has been estimated. The total is given on page 3 of the submission with the total investment in the area today at $1,429,614.97.

Q THE CHAIRMAN: That covers the wells in all the fields, Dr. Beach?

A Yes, the total exploratory effort in that area.

Q MR. GOODALL: Does that include the other wells in the area that did not find gas?

A That includes any wells we felt were necessary to determine the potential productivity of the area in the Pakowki Lake region. They represent the cost of dry holes as well as productive wells. I should note that it is only our contribution to the cost. In some cases wells were drilled by others on our behalf on our land as farm-out agreements, in which those cases are not considered in this list or computation.

THE CHAIRMAN: Any further questions you want to ask?

MR. MACLEOD: No further questions except to say that this covers in the form of testimony the information given in the application and the supplementary application supplying further information asked for by your Board, with the additional information.

THE CHAIRMAN: Anybody wish to cross-examine Dr. Beach?

CROSS-EXAMINATION BY MR. MARTLAND:

Q I just have one question, sir. Most of that expenditure shown on page 2, Dr. Beach, was during the period when it was hoped to make use of the natural gas for the development of synthetic gasoline, wasn't it?

A That was the period of our greatest drilling activity, in 1947, when we drilled 28 wells. That was prior to Leduc coming in, at a time when it was not apparent where gasoline was going to come from for this area.

Q With a view to the possibility of synthetic gasoline?

A That was given consideration at that time. It had not been finalized as a policy.

EXAMINATION BY MR. C.E. SMITH:

Q Doctor, I take it that the map in the pocket at the back of Exhibit 1 can be, for practical purposes, substituted for the map in the back of the original application, is that correct?

A This map has been checked as carefully as we can do it by independent members. We believe this map to represent

the various aspects that it is supposed to represent.

Q I am not being critical but you remember the map in the back of the original application, this one?

A Yes. This is substantially to supplant that map.

Q The only real difference between the two are the two wells you just mentioned?

A Yes, and there were changes in the land because we did not consider it with the map of the original application. As far as we know, this is an exact picture of our present land holdings in lease form in this area.

Q Just one other question. Referring to the map in the back of Exhibit 1, I notice in the Smith Coulee field you now have a sort of a - - what do you call one of these things?

A We have an outline.

Q To delineate the area, what kind of a figure? If it did not have round ends it would be a rectangle?

A Yes.

Q In any event, when you drew that figure there to show, as I understand, the Smith Coulee field area, did you base that on a mile radius circle from each of those wells and then join them up?

A That is right. We are using a principle that I believe has already been used in this Hearing, by using a mile radius around the well and then joining the tangents to those two cirles to give that form.

Q It looks familiar to Whitelaw, for instance?

A Yes.

Q And with regard to Manyberries, of course that does not

apply there?

A No, nor does it apply to Pendant d'Oreille or Black Butte.

Q That is all.

CROSS-EXAMINATION BY MR. NOLAN:

Q Dr. Beach, I am looking at Figure 2 in Exhibit 1, that is, the map. I am looking at the fields from which the gas is being gathered, Manyberries, Pendent d'Oreille, Smith Coulee and Black Butte. Would you tell me, please, how many Canadian communities are being served by your company in this gathering system?

MR. C.E. SMITH: Where is Figure 2?

MR. NOLAN: In the back of Exhibit 1, following page 12.

A THE WITNESS: Our company is not a utility company and does not sell gas, Mr. Nolan.

Q MR. NOLAN: All of the gas that is gathered in these four fields to which I have made reference is being trans-shipped into the State of Montana?

MR. MACLEOD: We are asking permission to trans-ship.

Q MR. NOLAN: I know, but we are all looking ahead a little bit. If you do get a permit, the intention is to transport the gas into the State of Montana?

A Yes.

Q As to all of it?

A As to all of it? I would not care to make that statement, Mr. Nolan. Some of the gas certainly would be exported to Montana.

Q Well, what will you do with the gas that is not exported to Montana?

A There is a question of ultimate extraction from the field. It may not be possible to get all of the gas out. I believe we have indicated that should a market develop in the division in which these fields lie, if it is economically feasible to do so, we would be prepared to provide that market with the necessary gas.

Q MR. MACLEOD: Dr. Beach, Figure 2, which is referred to by Mr. Nolan, what is the purpose of that?

A The purpose of that particular map was to outline the boundaries of Census Division No. 1.

Q In what connection?

A As a basis for the analysis of the population density of that particular part of Alberta. Inasmuch as we do not use the county system here, we had to strike some method of arriving at a boundary of an area as a subject of discussion and we have selected Census Division No.1 as being an area which the Government recognizes and which there are data available regarding the census.

Q And how did you come to supply that information? Was it at the request of the Board?

A Yes, sir, that information was supplied in response to a specific request from the Board at a previous Hearing. I forget the date but I can - -

Q I think you are wrong there. By letter, Dr. Beach.

A It was provided at a Hearing in response to a letter from the Board.

EXAMINATION BY MR. C.E. SMITH:

Q I wonder, sir, if I might ask one other question. I am not sure whether this should be directed to you or not, Dr. Beach, but if you know you can tell me.

A Surely.

Q Have you a copy of your application, your original application, in front of you?

A Not with me. Probably Mr. Macleod can provide me with one.

Q If you look at the first page, Doctor, please, the second paragraph. It says this:

> "Subject to the necessary licenses being granted and the assignments thereof approved, the applicants have agreed to sell and assign their interest in petroleum and natural gas hereinafter mentioned to the Montana Power Company or a wholly owned subsidiary thereof."

Are you in a position to expand that a bit for us as to just what that means, or should that be directed to somebody else?

A I think it would be more practical to ask Mr. Corette. He is in a position to discuss the capital structure and the relationship of the Montana Power Company and the subsidiary.

Q I did not want to go into any capital structure. I was interested in the words: "licenses, assignments of the agreement to sell", or essential interests in those rights. Should Mr. Corette deal with that?

A I think he is prepared to do so.

EXAMINATION BY DR. GOVIER:

Q Dr. Beach, I wonder if you might refer to page 11 of your submission, Exhibit 1?

A Of the present submission?

Q Yes, Exhibit 1. You give on that page, on the right hand side, the open flow capacity of wells in the area. First, I would like to ask, are all wells within the Pakowki Lake area listed here, that is, all wells that you are interested in?

A All potentially productive wells are listed. It does not list the various dry holes. Certain wells that had some gas but were not considered commercial wells or potentially commercial.

Q Is the open flow capacity on drill stem test figures or completed wells?

A Those open flow capacities, we have drill stem test information on a number of these wells. Those open flow capacities are determined through tests by blowing the well.

Q Are any back-pressure data available for any of those wells?

A No. We have not had the engineering staff available to

make back-pressure tests.

Q As far as you know, no tests of that type have been made?

A No back-pressure tests, as far as I am aware, have been made of those wells.

Q Thanks very much.

THE CHAIRMAN: Dr. Beach, on page 8 of the Manyberries field, and referring to page 6 of your original application, you have increased the acreage of 117,000 feet to 156,000 feet on the basis of the drilling of one additional well?

A What were those figures again?

Q The acre feet increase from 117,000 to 156,000?

A That is right.

Q Is that on the basis of drilling one additional well?

A That is right, sir.

Q Was there any seismic information used in delineating the field as you have it now?

A We have some seismic information in that area but it has influenced us in a very general way in location but I do not believe it is a specific method of location of sand traps. I know of isolated studied that have been made in other regions in America but I do not believe it is particularly applicable to this area.

Q Was it more or less just on the basis of the wells that have been drilled?

A Yes. In addition to that, of course, we have the control of the dry wells that have been drilled on the margin,

which contain representatives of the specific sands. They are used in preparing the map.

Q I notice that your average porosity on the original application is 25.6 for the Manyberries sand and you have it as 2.2 in the new application?

A I am afraid that is a mistake in decimal place. I did not see it. I would have to have that checked. It is 22, I believe. I believe that should read "22" rather than "2.2".

Q It should be 22?

A Yes, sir.

Q That is in the Manyberries sand. On the upper sand in the original application you show the porosity as 14% and now you have raised that to 20%. Now, could you give us an explanation of that, Dr. Beach?

A This is by further consideration by our engineers of the data that are available. It may be based on additional core information. I would have to ask specifically about that. We have additional core information but whether that is on additional tests for information or by further analysis of the data we have at hand to arrive at the most reliable figure to be used, I am not able to comment on that. I would have to enquire just how they did it.

Q Would you be able to get that information and present it to the Board?

A Yes, sir.

Q Before we close the Hearing?

A I think I can get it in just a matter of minutes, Mr. Chairman.

Q Then we might ask you to come back?

A Yes.

MR. MACLEOD: Where is that last figure, sir?

THE CHAIRMAN: I was comparing the porosity figures on page 6 of the original application with the porosity figures on page 8 in Exhibit 1.

MR. C.E. SMITH: The very bottom of page 6 in the original.

Q THE CHAIRMAN: Now, there was a difference in the connate water too, and on the original application that was 43 and it has now been reduced to 25 in Exhibit No.1?

A You are comparing the Manyberries field?

Q Yes, the Manyberries sand.

A I took part in the discussions regarding that figure and it was believed that with the data at hand and with the drilling of the additional wells that 25 was a much more reasonable figure than 43.

Q Were there any tests run on the cores to determine the connate water?

A Within this area, within this region, we have run many tests on the connate water. It has been conducted by the laboratories of Union Oil Company of California and also by the chemical and geological laboratories at Casper, Wyoming.

Q Have those tests been made available to the Board?

A Not any specific tests anyway. They are available to the

Board if they should like to have them.

Q Those should make quite a difference in your reserves, it being 43 and 25?

A It would be a factor, yes.

Q Could you supply those to the Board?

A Surely, I would be pleased to.

Q MR. GOODALL: On the Pendant d'Oreille field, your reserve acreage, I presume, - - I am referring to this map?

A Accompanying Exhibit No. 1?

Q Yes. I presume the acreage that you used in calculating reserves was that acreage outlined by this line around the field, is that right?

A That is not the information from which the acreage was taken. That line is drawn there to indicate the general outline of the field. The map that appears at page 7, isopached in the upper sand, is the map from which we gathered the information relative to the sand thickness and distribution of sand.

(Go to page 17)

Q Yes?

A By coincidence, the outline on this map is undoubtedly this one, but that is not the map that was used.

Q But that is approximately the outline of the productive acreage?

A Yes, very approximately.

Q I notice the west end is left open. Do you consider that that same productive zone would extend on through to some of these other wells?

A I believe that is very probable that that sand is represented in the Birdsholme Province well, and also the Imperial-California well that was drilled in Township 5, 11, to the west.

Q Which would be actually included in the field if they were joined up?

A Yes, sir. We regard our gas reserves as running to our fence lines, of course.

Q Well, your reserve is included in this area as outlined?

A Yes, that is correct, and they are reserves within our holdings.

.....

EXAMINED BY MR. C. E. SMITH:

Q Dr. Beach, apropos of what the Chairman was just asking you whether there was any significant change between your data in the original application and the data in Exhibit 1 today. I have just had a quick look at Pendant d'Oreille, or Pendant d'Oreille, Mr. Nolan - for instance, the thickness of the sand is 9.28 where it was 0.28. Is there anything that you wish to draw the Board's attention to?

A That specific one that you mention of 0.28 was a typographical error.

Q I was wondering about it, it looks so peculiar, 9.28 and 0.28?

A That was commented on, I believe, in previous testimony.

Q What about your connate water, for instance, there?

A As you may know.....

Q 24.6 and now 18?

A ....we had a considerable staff of engineers working on these data, attempting to revise them, and the data we are presenting at the present time is the considered opinion of a fairly substantial staff of engineers as the best appraisal of the data we have to give the best figure on the reserves possible.

Q All I am getting at is, Doctor, the changes that we have presented now, and there may be more, is it due to further information you have secured or to further study by your staff?

A In the greater part it is further information in the drilling of two wells, but to a lesser extent it is the refinement of specific factors through study.

Q Well, there would be no new wells with regard to the Pendant d'Oreille data?

A That is correct.

Q I have got about four pronunciations for that. So that any differences there are is accounted for apparently bu further study by your staff?

A That is correct, sir.

Q THE CHAIRMAN: Dr. Beach, in the Smith Coulee field, I notice that the thickness has been doubled

there between the original application, that is at page 7 of the original application, and page 9 of Exhibit 1?

A That is quite true. It is due to a further study of the not only the cores but the electrologs. We have both the cores and electrologs of these wells, and they have been studied further, and the present figures will be the latest concept or the latest interpretation of the data available.

Q You have increased the area from 5,000 acres to 6,700, and doubled the thicknesses, on the basis of your recent well, and further data?

A That is correct, sir. We had set up the reserves of the Smith Coulee field, showing a circle around the one isolated well. And now we have the second well, which we believe to be a step-out and a continuation of the Smith Coulee field.

Q Have you got any information there on the second well with regard to the thickness of pay in that second well, Dr. Beach.

A I do not have the electrolog with me.

Q DR. GOVIER: I believe that is marked on the map, is it not, Dr. Beach?

A The two sand thicknesses are given on the map following Page 9, 10.5 and 5.5.

Q Dr. Beach, I have one other question. On Page 12, the first sentence reads:

> "It is submitted that the area within the Province to be considered in this respect has geographic boundaries coincident with those of Census Division No. 1."

Am I right in assuming from that that it is your considered opinion that gas from the Pakowki Lake area could not economically be transported, say, to Calgary?

A I do not believe I am entitled to give an opinion on that subject. That is an economic question that I have not given consideration to.

Q Whose opinion is this, then,

> It is submitted that the area within the Province to be considered in this respect,"

that is in the respect of the area which might reasonably be served by these fields; whose opinion is that?

A I am expressing that opinion in this testimony. My reason for thinking so is with regard to the proximity of these fields to that area, and it would be reasonable for the gas in that area, if it is going to serve anyone in the Province, it would be within that area that it would be more logical to do so. I can visualize arrangements whereby this gas could be moved great distances, but whether that would be economical or not I am not prepared to state.

Q On your Figure 2 you show as a matter of convenience, I take it, the distribution and gathering system of the Canadian Western Company, which reaches down to Foremost?

A Yes.

Q That is very near Pendant d'Oreille. I just wonder, Dr. Beach, why it was that you singled out Census Division No. 1 as being in your submission the only part of the Province which might reasonably be served by the Pakowki Lake area? I appreciate the evidence that it is the Census Division that is closest to the area?

A Yes.

Q And in which the area falls?

A Yes.

Q But do you believe that those are the limits which that area might serve within the Province?

A I have regarded it so, and if it were to expand very much beyond that Census area, to the large market, it would be a major undertaking and would involve considerations far in excess of what we have given thought to in the preparation of our testimony.

Q Why would that same statement not be applicable to Foremost, which is now serving in part the Calgary area, you might say?

A You mean why should Foremost be regarded different to, say, Pendant d'Oreille?

Q Yes?

A At the present time Foremost is connected to a system extending into Calgary. It is my belief that the pipe line running from Foremost to Bow Island would be inadequate to carry our gas through it, so that at the present time the southern fields are to be regarded as isolated, and we regard them as having a different relationship to Census Division No. 1 than the Foremost field, which is already connected to the pipe line system running to Calgary.

Q So that you would say that regardless of the requirements of the Canadian Western system, it would not be reasonable to look to the Pakowki Lake area as an additional reserve to that system, is that about it? It would be more reasonable to look elsewhere than to the Pakowki Lake area?

A Certainly at the present time, yes, I would think so.

Q Thank you. Incidentally, I suppose that word "reserved" that appears at the top of Page 12 should have been "served" in the caption "Which Might Reasonably be Reserved"?

A Yes, that should be "served".

Q THE CHAIRMAN: Dr. Beach, did you have anything to do with the preparation of the original submission or preparation of the estimated construction costs of the Canadian portion and the American portion of the line?

A In formulating the data?

Q Did you have anything to do with the preparation of data in the original application?

A No, sir.

Q Have you anybody here who could answer any questions with regard to that?

A I believe so, yes, sir.

Q Yes?

A Yes, information in that respect will be made available to the Board.

MR. S. B. SMITH: Could I ask a question, please, Mr.Chairman?

THE CHAIRMAN: Yes.

.....

CROSS-EXAMINATION BY MR. S. B. SMITH:

Q You know Mr.Ralph E. Davis, Dr. Beach?

A I am not acquainted with him but I know who he is.

Q He is a man of very high reputation?

A Is that a question, sir?

Q Yes, that is what I am doing, asking you questions.

A I am not in a position to comment on his reputation.

Q Don't you want to comment, or don't you know?

A I do not know.

Q I see. Do you know that he has been the adviser of the utilities in Alberta, Canadian Western and Northwestern, since, I believe, about 1925?

A I do not know that.

Q You do not know that?

A No.

Q How long have you been in Alberta, Dr. Beach?

A How long have I been in Alberta?

Q Yes, in connection with your profession?

A Since 1928.

Q And did you not know that Mr. Davis has been the adviser of the local Gas Company?

A I knew that at times he has been consulted in some capacity, but what his relationship with the Gas Company is, I do not know about that.

Q And you do not know anything about Mr.Davis's reputation at all?

A I presume he is a man that is competent in gas matters, but I know nothing about his academic background or his previous professional activities.

Q I see. Well, on October 31st, 1950, at Volume 2, page 169, Dr. Beach, he said,-

"The Pakowki Lake country, I think, has around 250 billion."

Your figure is somewhat higher, of course?

A Yes, sir.

Q "It might be possible to plan out a pipe line based on those fields. That might be possible."

He is talking about a pipe line to Calgary.

A Would you mind reading that question again?

Q I beg your pardon?

A Would you mind reading that quostion again?

Q "The Pakowki Lake country, I think, has around 250 billion. It might be possible to plan out a pipe line based on those fields. That might be possible."

I will read to you the rest of the statement.

" Personally, if I were responsible up here for the future of a utility company like Canadian Western, I would want to be assured of some gas beyond that which Canadian Western now has. At this moment that might mean some part of the Pincher Creek or Pakowki Lake thing."

Did you hear him give that evidence?

A I believe I did, yes, sir.

Q Yes. I do not think you would be prepared to disagree with his statement, would you?

A I just wonder if it is a direct statement. It seems to me the question is raised in the form of "it might be".

Q Well, for what it is worth?

A He has made a suggestion.

Q He says:

"It might be possible to plan out a pipe line based on those fields."

Do you disagree with him, Doctor, or do you agree with him?

A In the sense that almost anything can be planned, I would agree with him.

Q You say it is possible, then, that is as far as you want to go?

A Whether it is economically possible or not, I do not know.

Q I see. Have you considered -

A But it is possible to plan.

Q Have you considered whether it is economically possible or not?

A No, sir, I have not.

Q No. Perhaps Mr. Davis had. You do not know, I suppose?

A I do not know.

Q Well now, he said -

MR. C.E. SMITH: If Mr. Davis did, he did not do very well in his evidence.

Q MR. S.B. SMITH: He said:

"At this moment that might mean some part of the Pincher Creek or Pakowki Lake thing."

He is obviously there suggesting that consideration should be given to connecting the Pawkowki Lake territory to the Canadian Western system, isn't he?

A If by "thing" he means the territory, yes.

Q Well, I do not want to argue with you about the use of the word "thing" by Mr. Davis. You know what Mr. Davis was talking about, so do I.

A I think he was thinking of the entire Pakowki Lake development.

Q Yes. He was definitely suggesting that consideration

should be given to tying Pakowki Lake into the Canadian Western system, wasn't he?

A The word "definitely" I do not know; I do not know whether that is correct or not.

Q Well, we can leave the interpretation of the evidence to the Board. You do not want to go any further than you have gone with me, is that it?

A Would you mind repeating your question, Mr. Smith?

Q I do not think it is sufficiently important to waste time on doing it, Dr. Beach, unless you want to go over it again. If the application that you are supporting here were granted, it would preclude the possibility of the Pakowki Lake area being tied into the Canadian Western system, wouldn't it?

A Making that tie-in is certainly not in our present plans.

Q Well, you can not do the two things. You can not commit this gas to the Montana Power Company and then also commit gas to the Canadian Western?

A That is right.

Q You can not complete pipe lines in both directions and make it economically feasible, can you?

A Unless we were requested to provide gas to two markets.

Q Yes, but you have committed this gas to the Montana Power Company, haven't you? It is committed by contract?

A Yes.

Q The whole of the gas?

A Yes.

Q You want to export the whole of the gas?

A Yes.

Q And the pipe line is being built and the economics are being considered in relation to the whole of this gas being exported to Montana?

A That is our petition.

Q Would you go on with this thing if you could only get half of this gas to export to Montana?

A Well, that would require some very careful consideration.

Q It is very doubtful, I suggest, isn't it? I should think that it would be just about impossible, wouldn't it?

A I would not care to comment on that.

Q I see, all right.

Q THE CHAIRMAN: Dr. Beach, you will be back later with additional information?

A Yes, sir.

Q All right, thank you, Dr. Beach.

(Go to page 28)

MR. MACLEOD: I will call Mr. Corette, John E. Corette, Jr.

JOHN E. CORETTE, Jr. having been duly sworn, examined by Mr. Macleod, testified as follows:-

Q Mr. Corette, you are an officer of the Montana Power Company?

A That is correct, sir. I am Vice President and Assistant General Manager.

Q How long have you been with the company?

A I have been with the company a little over 20 years.

Q And is part of your duty executive?

A Yes, sir, practically all of it.

Q You have prepared a submission here, Mr. Corette?

A Yes, sir.

MR. MACLEOD: Should Mr. Corette read this submission, sir?

THE CHAIRMAN: Yes, I think he had better.

A PURPOSE OF THIS PRESENTATION

McColl-Frontenac Oil Company Limited and Union Oil Company of California, who are the present owners of gas reserves in the Manyberries, Smith Coulee, Black Butte and Pendant d'Oreille Fields, have contracted to sell their holdings in the Pakowki Lake area to The Montana Power Company.

I might add to the written submission that that is a binding contract which obligates the Montana Power Company to buy these reserves if the necessary permits are obtained from both the Canadian and the United States Governments.

An Alberta Company, named "Canadian-Montana Gas

Company Limited", has been incorporated and organized, the directors of which are:

Mr. J. M. Pritchard, President of McColl-Frontenac Oil Company Ltd. and President of the new Company
The Honourable James A. McKinnon
Mr. A. C. Rubel, Vice-President of Union Oil Company of California
Mr. F. W. Bird and myself, President and Vice-President, respectively, of the Montana Power Company

It is the intention that if the necessary export permits are granted this new company will acquire the land and land rights and production facilities in the Pakowki Lake area, covered by the above described contract, and will operate the field.

In addition, the Parliament of Canada is being petitioned to incorporate a pipe line company under the name of "Canadian-Montana Pipe Line Company", to own and operate the gas transmission lines which will be necessary to transmit the gas from the Pakowki Lake area to the Canadian-Montana border, if the export permit being applied for is issued. The Montana Power Company will be the principal stockholder of each of these companies.

In order to give your Board information as to the experience, financial standing, ability to carry out its obligations, and the general reputation of The Montana Power Company, I shall endeavour to present to you what appear to be the most important facts regarding The Montana Power Company, Canadian-Montana Gas Company Limited and the proposed Canadian-Montana Pipe Line Company.

Although these applicants plan to export to Montana only a small amount of gas as compared with the

the amount of gas for which export permit is requested by the other applicants, the need for this gas is vital both to the people of Montana and to the defence program of Canada and the United States, so I shall endeavour to present as comprehensive a picture as possible.

Description of The Montana Power Company

The Montana Power Company is an electric and natural gas utility company, operating in approximately two-thirds of the State of Montana. It was organized in 1912 and was created for the purpose of acquiring electric production, transmission and distribution properties which were or had been owned by approximately 100 other companies throughout Montana.

This Company and its predecessors have been in existence and engaged in utility operations for almost seventy years.

In 1930 and 1931 The Montana Power Company, acting through an affiliate, acquired the principal gas reserves in the Cut Bank Oil & Gas Field, which is located in Glacier County, Montana, just south of the Canadian-Montana border. It immediately built 204 miles of 20" pipe line from that field to the Cities of Butte, Helena, Anaconda and Deer Lodge in Montana. At the same time, it contracted to purchase the out-put of the Dry Creek field in South-Central Montana and built 116 miles of 10-3/4" transmission line from that field to the Cities of Red Lodge, Absarokee, Columbus, Big Timber, Livingston and Bozeman.

The Montana Power Company has approximately

1,300 employees, with an average period of service of 10½ years each, has 118,344 electric customers and 32,300 gas customers.

The stock of The Montana Power Company is owned by approximately 30,000 stockholders, and approximately 10,000 of these are residents of Montana. Its officers and directors are and for practically their entire lives have been residents of Montana.

Its properties and facilities have cost approximately $138,500,000.

The Montana Power Company's capital structure is briefly as follows:

Common Stock has a book value of $31,000,000 and a market value, as listed on the New York Stock Exchange of $54,596,630. I might comment by saying that I used the market value of $22.00 per share, because for many months the stock has been within half a dollar of that figure, up or down. Preferred stock, $15,958,900 book value, and market value, $18,512,324. In making that estimate of the market value I used the prevailing market value of $116 per share, which has been approximately the market value of that stock for the last 15 years. Giving a total stock book value of $46,958,900 and a market value of $73,108,954. Our bonds outstanding are $39,188,000, Notes outstanding, $4,000,000, making a total debt of $43,188,000. We have an earned surplus of $6,910,493.

The Montana Power Company's percentage of funded debt to total capitalization is one of the lowest of the utility companies in the United States, which places it in

an excellent position to raise by public financing any funds which it might require. I might say which it might require over and above the cash which it has available each year from its own earnings for re-investment in new property.

Earnings of The Montana Power Company for the twelve months ended October 31st, 1950, are:

Total Operating Revenues.....	$25,179,657.67
Net income after all expenses, taxes and interest, available for preferred and common stock dividends.....	8,107,282.00
Balance after payment of preferred and common dividends.....	2,930,918.30

A Balance Sheet and Statement of Income and Surplus, as of October 31st, 1950, which gives more detailed information has been prepared and Mr. Macleod has copies.

THE CHAIRMAN: All right. Your submission will be marked Exhibit 2 and the financial statement marked Exhibit 3.

SUBMISSION BY MR. CORETTE
MARKED EXHIBIT 2.

FINANCIAL STATEMENT OF THE
MONTANA POWER COMPANY
MARKED EXHIBIT 3.

MR. S. B. SMITH: Have you copies of that?

MR. MACLEOD: Apart from it being an exhibit I do not know that it should be distributed particularly. If you want it I can let you have a copy.

MR. S. B. SMITH: I would like to have a look at it, if I can.

THE CHAIRMAN: There is an extra copy here if you wish it.

A Cash available for Investment in New Construction

Based on its operations during the past twelve months, The Montana Power Company has cash available annually for new construction as follows:

Balance available after paying all expenses, taxes, interest and dividends...	$2,930,918.00
Cash available from retirement and depreciation reserve appropriation.....	1,550,000.00
Total.....	$4,480,918.00

I might add that that naturally varies each year to some extent but that being the last twelve months seemed to be the best indicator.

Importance of Canadian Gas

There is a real and pressing need in Montana for Canadian gas.

The climate in Montana is quite comparable to that of Alberta. In fact, the two are quite comparable in most particulars, except that Montana is not as fortunate as Alberta in having extensive supplies of oil and gas.

I might add there that it appears to us as if the Canadian-Montana border stops the gas reserves and the Montana-Wyoming border the same thing. Although, of course, the Wyoming discoveries have been nothing like Canada.

The 28,860 residential and 3,194 commercial gas customers of The Montana Power Company rely on natural gas as their sole fuel for heating and many other purposes. Almost without exception, these customers have no other facilities to heat their premises and are entirely dependent on a supply of natural gas.

The principal large industrial gas customers of The Montana Power Company are in the large mining, smelting and refining operations of Anaconda Copper Mining Company and American Smelting & Refining Company at Butte, Anaconda, Great Falls and East Helena. These operations have been in existence for many years. Their plants and metallurgical processes which require fuel all are designed for the use of natural gas. Their importance not only to the national economy of the United States but at this time to the vital defence program of Canada and the United States is demonstrated by the fact that during World War II these operations produced annually from 11.5% to 14.2% of the United States output of copper; from 21.4% to 25.8% of the United States output of zinc; and from 61.2% to 75.2% of the United States output of Manganese.

This production from the last War is used, as it is the best indication of what the output of these mines, smelters and refineries would be in another war. In addition, the present production is quite comparable to that during the last war, except that now Anaconda Copper Mining Company is producing approximately 97% of the manganese produced in the United States and is actually mining much more zinc than it did during World War II.

Anaconda Copper Mining Company uses approximately ten billion cubic feet of gas per year. Unless additional gas supplies can be obtained, it will be necessary to curtail deliveries to Anaconda Copper Mining Company during the Winter of 1951 and 1952, and thereafter, which will seriously disrupt this important defence production.

Canadian Operations

It is intended that Canadian-Montana Pipe Line Company will have a contract to buy gas from Canadian-Montana Gas Company Limited, and The Montana Power Company will have a contract to buy gas at the Canadian-Montana border from Canadian-Montana Pipe Line Company. These contracts will be for a term and at rates sufficient to enable the two Canadian companies to meet all of their obligations of both an operating and a financial nature. The Montana Power Company is prepared to provide or procure for the two operating companies the necessary funds for their construction and operating programs.

Canadian Extension

The proposed construction of transmission facilities from Canada to The Montana Power gas system will supply in part the gas requirements of The Montana Power gas system including normal anticipated growth and normal expansion. The only normal expansion contemplated at this time is an extension to Missoula, Montana from our system at Deer Lodge. There has been considerable public pressure on our Company for several years to extend our lines to Missoula, but we would like to have additional gas reserves before making this extension. A map is attached hereto, Fig. 1, showing the present facilities of this system and the proposed connection with Canadian sources of gas supply.

The map appears immediately after page 7.

The next section of the presentation relates to gas transmission facilities, and perhaps

I can brief it without reading the details?

THE CHAIRMAN: Yes.

A The Montana Power Company's gas system up until this year was divided really into two systems, the West line and the East line. The West line was a 20-inch line extending a distance of 204 miles from the Cutbank gas field south to the towns I previously mentioned, Butte, Helena, Anaconda and Deer Lodge. From a point on the line called Riebeling in Lewis & Clark County there is 43 miles of transmission line, 12-3/4 inch size, to the city of Great Falls where our company supplies the smelter of the Anaconda Copper Mining Company but does not deliver gas to the city. At Helena Junction there is a 10-3/4 tap line extending 14.68 miles to the cities of Helena and East Helena. At Morel Junction there are two extensions, one a 12-3/4 inch line, 9.41 miles to serve the area in the vicinity of the city of Anaconda and the other a 16-inch line to serve the area in the vicinity of Butte. The so-called East line takes in the Dry Creek gas field in Carbon County, Montana and extends a distance of approximately 116 miles to Bozeman, Montana. In addition to this Dry Creek gas field we have 22 miles of line extending south to a point very close to the Montana-Wyoming border connected with the Clark's Fork gas field. On these transmision lines we have two compressor stations, One main line compressor station is 1200 horsepower capacity installed on the 20-inch transmission line at a point approximately 16 miles from the north end of that line. Presently there is being constructed a 1200 horsepower main line compressor station on the 10-3/4 inch East line at a point

adjacent to Absarokee in Stillwater County, Montana, and this station will be in operation, I think, before January 1st, 1951.

The existing pipe lines are shown on the attached map which is designated as Figure 1 following this sheet. The proposed connection with the Canadian sources of gas supply is shown as a dotted line.

Local Distribution of Gas

The Montana Power Company owns and operates the gas distribution systems in the following Montana cities and towns as of October 31, 1950:

Fairfield	Anaconda
Wolf Creek	Butte
Helena and E. Helena	Bozeman
Elliston	Livingston
Deer Lodge	Big Timber
Galen	Columbus
Warm Springs	Absarokee
Roberts	Red Lodge
Belgrade	Manhattan
Three Forks	Whitehall

The last four towns, Absarokee, Red Lodge, Manhattan and Whitehall are small towns between Butte and Bozeman and along the line which now interconnects the East and the West lines of this distribution system, which has been completed in recent months.

Markets

The Montana Power Company gas system, as of October 31, 1950, had a total of 32,306 gas customers exclusive of interdepartmental customers. By classes of usage these were divided as shown below:

Residential	28,860
Commercial	3,194
Industrial	239
Government and Municipal	13
	32,306

Pressure Base for Gas Volumes

With the exception of Table VII, all references to gas volumes in this submission are reported on a pressure base of 14.9 psia in accordance with the established measurement and records practice of The Montana Power Company. Table VII reports gas volumes on a pressure base of 14.4 psia to conform to Canadian practice. All gas volumes in Exhibit J-11, presented at the joint hearing commenced on October 30, 1950, are at 14.4 psia.

And the reason that we set Table VII up on that basis was so that it could be related to Exhibit J-11.

General Data

Gas is used for cooking, water heating, space heating, processing, smelting, refining and ceramic firing on our system.

Unit consumption for residential customers was 171 MCF per customer per year for 1949.

Unit consumption for commercial customers was 700 MCF per customer per year for 1949. (Shown in error in original application as 549 MCF per customer.)

The total population in the areas where gas service is available from The Montana Power Company is estimated at 115,000 during 1950.

Actual deliveries during 1949 on The Montana Power Company gas system are shown in Table I.

Space heating requirements are severe, the degree day deficiency for this area averaging in the neighborhood of 8,000 degree days per year. Detailed averages for the principal cities are appended at Table II.

Official climatological records for the State of Montana, 1949 issue, by the U.S. Department of Commerce, Weather Bureau, are attached, as required by the "Gas Resources Preservation Act".

I might say in connection with these Tables that although they are attached they are not in all instances the basis for the weather records that we have, but we have furnished them here because we understood that to be the requirement of the Act.

Low mean temperature in the area served may reach 35° below zero.

Growth

Increase in consumption on our present system, exclusive of large industrials, is estimated at 3% per year which we believe is a conservative figure, considering that the growth in the past four years has ranged from 4.6 to 9.0% as indicated below.

YEAR	GAS DELIVERIES IN MILLIONS OF CUBIC FEET PER YEAR (EXCLUSIVE OF LARGE INDUSTRIALS) CORRECTED TO NORMAL WEATHER EACH YEAR	GROWTH EXPRESSED IN PERCENTAGE OF PREVIOUS YEAR
1946	6,280	-
1947	6,861	9.25%
1948	7,453	8.63%
1949	7,801	4.67%

Increase in the number of customers on present

system is estimated at 3% per year.

Increase in the number of customers for the past four years is shown by classes on Table III. For the fifth year of operation, or 1955, the total number of customers is estimated at approximately 37,850. For the tenth year of operation, or 1960, the total number of customers is estimated at approximately 44,210, and for 1970 the total number of customers is estimated at approximately 59,411.

Tables are appended showing annual estimated requirements and supplies on Table IV, and estimated maximum daily requirements and supplies on Table V.

Table VI estimates the proposed monthly withdrawals for the year 1955.

Table VII is appended showing estimated annual peak month, peak day, and peak hour withdrawals from Canada.

Table VIII is appended showing estimated annual load, estimated maximum monthly load, estimated maximum hourly load by classes of customers for the entire Montana Power Company system.

Tables VIII and IX of Exhibit J-11, submitted by John F. Dodge, are based on Table III of Exhibit J-11, which is a table of The Montana Power Company requirements from Canadian sources. Since the preparation of Table III of Exhibit J-11 and since the filing of this application, further studies indicate that beginning with 1961 the requirements from Canadian sources are greater than set forth in Table III of Exhibit J-11. The revised and accurate information now appears in Tables IV, V, and VII, just submitted by me. Mr. Dodge has advised me that the four fields

covered by this application have reserve and deliverability characteristics adequate to supply the annual requirements and the maximum daily requirements set forth in said Schedules IV, V and VII, as now submitted. Mr. Dodge would be pleased to submit revised sheets for Exhibit J-11 if you so desire.

Do you care to have the Tables read, Mr. Chairman?

THE CHAIRMAN: No, I do not think it is necessary.

MR. MACLEOD: These revised sheets have been lodged with the Board.

THE CHAIRMAN: Beg pardon?

MR. MACLEOD: These revised sheets prepared by Mr. Dodge and referred to by this witness have been handed to the Board.

THE CHAIRMAN: You mean this morning?

MR. MACLEOD: Yes, sir.

DR. GOVIER: Is that the one marked "Revision to J-11"?

MR. MACLEOD: Yes, these are the revised tables.

THE CHAIRMAN: We will mark that Exhibit 4, Mr. Macleod.

REVISIONS BY JOHN F. DODGE TO HIS SUBMISSION ON MARKET REQUIREMENTS AND DELIVERABILITIES MARKED EXHIBIT J-11 are NOW MARKED EXHIBIT 4.

MR. C. E. SMITH: Are these sheets the revision of Dr. Dodge's submission?

MR. MACLEOD: The three tables in J-11.

MR. C. E. SMITH: Have you any more of these?

MR. MACLEOD: Yes. We are having some more made.

Q DR. GOVIER: Before you go ahead I wonder if I might ask you if Table VII is based on 3% per year growth?

A It is based on 3% per year growth for business exclusive of what we call large industries, which is practically nothing but the Anaconda Copper Mining Company. It is based on no increase in Anaconda Copper Mining Company loads.

Q Your commercial and domestic have been presumed to grow at 3%?

A 3%.

Q And industrial to remain level?

A Large industrial only. We have a classification Commercial and Small Industrial and the 3% applied to everything other than Large Industrial, and the Large Industrials continued without change.

Table I, however, briefly will show you that the total deliveries from The Montana Power Company's system in the year 1949 were just over 15 billion cubic feet, and the total of these deliveries have been divided up by towns on the so-called West line and East line.

Table II gives the average degree days by months for the principal cities on our system and this is the temperature data which we use in connection with our operations instead of the official climatological data. In many locations they are the same but perhaps I should explain why we have our own set of figures. When we went into this business we found that at certain temperature recording stations records were available for only a short period of time. Consequently we collected all the available data back as far as 56 years from the present time and made up a completely new set of records using the official records

wherever available and wherever a station was located at a point that would give an accurate temperature report for our system. I could use the city of Butte as an example. Butte, as you people may know, is located on the side of a hill. The principal mines are entirely on the hill, right on top of the hill. South of the city there is a valley that is commonly called "The Flat". The variation in temperature during severe weather between the uptown section of Butte and The Flat will be as much as an average of 12 to 14 degrees. It is colder in the bottom of the valley. Because of that we have established a temperature recording station and used it for about 20 years at a point about halfway up the hill. We think that gives us a better average figure than using either the official station at the airport in the valley or the official station at the Montana School of Mines which is on top of the hill. There is some variation there. Other places we use our own data because there is no satisfactory Government data available. Ours has been carefully prepared and carefully compiled and we think it is quite accurate, and it does not show a great variation from the official data except where you have a condition such as I explained in the city of Butte.

Table III shows the actual increase in the number of customers which we have had in past years. We felt that for forecasting and for a conservative forecast that we should not use the increase as great as shown during the past few years because of the fact that those were post-war years and we felt that the increase in customers and in consumption during those years was probably greater than

should be anticipated in future years. If we go back as far as approximately 15 years, when our system had been in existence 5 years and was reasonably well served, we look at the over-all increase from 1936 to the present time and it adequately supports our 3% increase in the future.

(Go to page 45.)

Q THE CHAIRMAN: That would cover your industrial as well other than your large industrial?

A Yes, our small industrial.

Q DR. GOVIER: Are the degree day figures in Exhibit 2 on a 60 degree or 65 degree basis?

A They are on a 65 degree basis. I should say all the degree days are on a 65 degree basis. Table 4 merely shows our anticipated market and the part that would be taken from U.S. sources and Canadian sources. Table 5 shows the estimated daily maximum requirements. I might comment for a moment on Table 4, if I may, please. This Table differs from the table set forth in the original application and differs from Table 3 in Exhibit J-11, and it is the adjustment of this table to bring it up to date and to correct it which has made it necessary to submit Exhibit 4, which was recently handed to you, and which was prepared by Mr. John F. Dodge. It might be helpful at this time if I gave a very brief explanation of what we find in this table that required adjustment. The original application in connection with the 1970 figures - - now, Mr. Chairman, I should correct that last statement. The differential in Table 4 of the original application and the Table 4 now is that we have added a 1970 line, and that was what made it necessary for Mr. Dodge to submit a revised statement. But Table 4 in the original application and Table 3 in Mr. Dodge's original submission were not identical because Mr. Dodge's table did show a 1970 figure and as further study was carried on it became very obvious that the deliveries

shown in Table 3, the requirements of Montana Power Company, were set forth in 1970 in such a way that we would not have been able to meet our peak requirements because the Montana sources were not capable of producing the amount of gas which by inference from Table 3 and Exhibit J-11 was left for the Montana sources, and that has not been revised and corrected to show what the situation would be and what is estimated we could do at that time.

Page 11 of the statement refers to load factors. It shows an estimated load factor in 1955 of 55.2%, in 1960 of 56.61%, and in 1970 of 85.5%. The reason for the high load factor in 1970 is that beginning in 1961 it is necessary to increase withdrawals from the Canadian sources and it reaches a point where the combined United States and Canadian sources would not be able to supply the maximum day directly from production and storages contemplated in the fields which we now have in the United States during the years after 1960.

Relative usage by classes of customers of the Montana Power Company system during 1949 is shown at the bottom of page 11.

Q MR. MACLEOD: You had better read those.

A It shows a total figure of 15,074 974,000.

I believe that Table 6 is clear and Table 7. Table 8 seems to be clear in itself.

Gathering and Transmission Facilities

The proposed gathering and

transmission facilities that would be required in both Canada and the United States would be designed and constructed in accordance with modern pipe line practices. The route has been tentatively selected on the basis of preliminary reconnaissance only and is subject to change upon completion of final survey. However, the rolling prairie country to be traversed between the Pakowki area and the point of connection to The Montana Power Company system presents no difficulty to pipe line location or construction. Where practicable, materials to be used in Canada will be purchased in Canada, but United States prices are used herein to approximate construction costs.

From a central point in the Manyberries Gas Field in southeastern Alberta, it is proposed to lay approximately 21 miles of 10¾" pipe in a southwesterly direction to a suitable junction in the Pendant d'Oreille Gas Field where the line is increased to 16" pipe. The 16" line extends approximately 15 miles to the Canadian-U.S. border and thence southwesterly to a junction with The Montana Power Company's existing 20" line at the Outbank, Montana, compressor station.

Canadian Facilities

The Canadian facilities presently required would include well measurement stations, well dehydrators and the following quantities of pipe, which have already been contracted for from Canadian sources:

15 miles of 15" OD x 1/4" wall

32.5 miles 10¾" OD x 1/4" wall

8.5 miles 6-5/8" OD x Std. wall

23.5 miles 4½" OD x Std. wall

The above pipe represents only 4,895 tons of steel, and the initial Canadian investment is estimated at approximately $1,750,000.00.

United States Facilities

The portion of transmission line south of the Canadian-U.S. border consists of approximately 59 miles of 16" x 1/4" pipe, representing only 6,550 tons of steel and an installation cost estimated at approximately $1,900,000.00.

The Montana Power Company has pipe ordered and deliveries scheduled and upon receipt of the necessary permits is prepared to proceed immediately with the connection of the Manyberries, Pendent d'Oreille, Smith Coulee and Black Butte fields to The Montana Power Company system.

Export Permit Requested

I wish to emphasize the fact that this application is for a permit to export to Montana all of the reserves in the four fields named in this application. Tables IV, V and VII of this submission contain the best forecast that The Montana Power Company engineers can make at this time as to that Company's requirements from Canadian sources throughout the next

20 years. However, time is very liable to make a 20-year forecast inaccurate, and when you add to the total gas required for the period 1951-1970 inclusive, the annual requirements for the period 1971-1975 inclusive (the balance of the period of the permit applied for), plus the requirements of loads in The Montana Power Company's service area in Montana, which it may be required or find desirable to supply in the next 25 years in the course of normal expansion, you have a total requirement which, in all probability, will exceed the total marketable reserves of the four fields in the Pakowki Lake area, which are the subject of this application.

Conclusion

I realize that this is a rather lengthy presentation to make in connection with an application for a permit for the export of such a small amount of gas as compared to the export requirements of the other applicants, but although our requirements from Canada are not large by comparison, I believe that the facts presented show that they are of vital importance to the people of Montana and to the defense program of the United States and Canada.

We think that the length of this presentation is justified, because we know that you are interested in the basic facts regarding The Montana Power Company, Canadian-Montana Gas Company Limited and Canadian-Montana Pipe Line Company, regarding the experience and standing of The Montana Power Company

in the gas business, its financial standing, its ability to carry out its obligations, and, perhaps most important of all, the kind of people who are going into business in your great and constantly developing country, if this export permit should be granted.

I might say that in preparing the tables of load forecasts, we limited those tables and those forecasts to our presently existing natural gas system because, as you will see from a study of the tables, the future requirements of that system, without any expansion in the next 25 years, will use practically the entire reserves of the fields in the Pakowki Lake area. I would not want by that to leave an inference that it will not be necessary to expand our system to some extent because I mention the town of Missoula here, and there has been for years a great pressure for us to extend to Missoula, and that has been materially increased by the publicity which has been in the newspapers in the last year regarding the gas reserves available in Canada and regarding the possibility that some of those may be exported to Montana. But we feel those things would have to be taken in stride and that it is not easy to estimate with any accuracy that type of expansion, while there is a sound fundamental basis for estimating the future of an existing system in an existing area where you have been operating for a great many years. I believe that that completes the direct part of my presentation.

THE CHAIRMAN: We will recess.

(The Hearing then took a short recess.)

CROSS-EXAMINATION BY MR. NOLAN:

Q Mr. Chairman, I was just going to ask Mr. Corette one question, if I may, please. Mr. Corette, I see that your company is an electric and natural gas utility company, and on page 4 you explain that there are 28,860 residential and 3194 commercial gas customers of your company who rely on natural gas as their sole fuel for heating and many other purposes. Where does the gas come from now, Mr. Corette, that these residential and commercial customers rely upon?

A We have at this time, Mr. Nolan, two main sources of supply, the Outbank field in Northern Montana, which shows on Figure 1, and the Dry Creek field and the Clarks Fork field clear at the southern end of the line shown on page 4.

Q As explained on page 2?

A That is right, as explained on page 2.

Q Thank you.

CROSS-EXAMINATION BY MR. MARTLAND:

Q Mr. Corette, I suppose you are aware of the contents of the letter from the Honourable, The Minister of Mines and Minerals which was filed as an exhibit in the application of Western Pipe Lines?

A I am aware of it only from the reading of the newspaper clippings.

Q In the course of that letter, after referring to the necessity of protecting Provincial needs, the Minister went on to say:

"When fully satisfied that this surplus exists over and above these requirements, sufficient to justify export under sound conservation and proration practices, the Government will approve the export of such surplus, with each application being considered on its own merits and in the light of all prevailing circumstances. Furthermore, it will be a condition of any export permit that Canadian requirements must be given first priority."

There are no Canadian requirements which would be served if your application were granted, are there, Mr. Corette?

A Well, if our application were granted I would say there would be no Canadian requirements served by the gas which we take down to Montana. If there are some requirmements in that general area, such as Dr. Beach was cross-examined about a few moments ago, of course we would expect to take care of those.

Q That is just the area contained in the Census Division in which these various fields are located?

A Well, I was thinking of the area in the vicinity of the Pakowki Lake area and along the transmission line which we would build to Montana if a permit was granted.

Q But that would be all?

A Yes. We would not expect to go extensively into the gas business in Canada.

Q And I suppose you are aware from the exhibits which were filed in connection with the application of Western Pipe

Lines and at the Joint Hearing that if gas is to be taken to Saskatchewan and Manitoba it is going to necessitate the export of gas from the Pakowki Lake area as well as Pincher Creek?

A Well, I am just very generally familiar with that situation. I was not here at the Joint Hearing and I am not familiar in any detail with the reserves in Canada or the gas requirements in Canada, in Alberta.

Q And you have stated in your submission that this contract between your company and the McColl-Frontenac and Union involves the purchase of these entire fields?

A That is correct, yes.

Q These four fields. And they will become the property of a Canadian subsidiary of Montana Gas Company?

A That is correct, sir.

Q During the course of the Dinning Commission there was a great deal of discussion about reserves in the State of Wyoming and the possibility that those reserves might capture markets which might otherwise be available to Alberta. Have you any knowledge of the Wyoming reserves, Mr. Corette?

A Yes, to some extent, from the efforts which we have made to purchase gas in Wyoming. I am not a technician and my knowledge comes primarily from what the technicians report to me.

Q Yes?

A But we have for the last two or three years very aggressively endeavoured to acquire reserves in Northern Wyoming

which could be connected to the Southern terminus of the transmission line which is shown on the map, Figure 1, and which ends at the Clarks Fork field.

Q Yes?

A There was one reserve in what you might call the northern half of Wyoming which was consequential and that was the Worland field. The Worland field belonged to the Pure Oil Company. We endeavoured to buy that field, to buy the gas from that field, from Pure Oil Company but it was sold to Montana-Dakota Utilities Company and is being transmitted in a general northeasterly direction into Eastern Montana and North Dakota. The other reserves in the northern 100 or 150 miles of Wyoming that we have been negotiating for are all very small, running from - - first of all, they are so indefinite that nobody has an accurate estimate of their size but the general opinion is that they run from 1 billion cubic feet up to 15 billion, 20, 25 billion cubic feet. We have purchased the Hard Mountain field in Wyoming, or we have purchased the leases in that field. We estimate that reserve at about 15 billion cubic feet.

Q 15 billion?

A Yes. So that all of our contacts in Northern Wyoming, which have been very extensive, indicate that there is no gas available there in quantities of any size which could be of any particular benefit to our company for any long period of time.

Q Can you tell us what is the size of the field from which this other company is exporting from Wyoming into Montana

and Dakota?

A Yes. You mean that Worland field?

Q Yes?

A I think I have a note or two on it. Oh, from memory I could say that at the time we were negotiating with Pure Oil Company that that reserve was considered in the neighbourhood of 350 to 400 billion cubic feet.

Q Thanks very much.

CROSS-EXAMINATION BY MR. S.B. SMITH:

Q Mr. Corette, you give some emphasis to the importance of defence production in Montana and the contribution to the defence production which the importation of Canadian gas would make in your brief which you read today?

A Yes.

Q Are you aware of the fact that Mr. Howe in his letter to Mr. Tanner, the Minister of Mines and Minerals of Alberta, on September 16th, 1950, pointed out that the United States Munitions Board was then seriously concerned about the lack of fuel in the Pacific Northwest section of the United States, where the war-time industrial development, together with diversion of normal oil supplies to the Far East, has seriously accentuated the scarcity. You have read that letter?

A I have never seen the letter. I have just read the newspaper clipping which described in general terms the letter.

Q You would hardly be in a position to weigh the comparative needs of the Pacific Northwest and the State of Montana

in relation to defence production? That would be a very difficult undertaking for you, I am sure.

A I would think that would be a difficult undertaking for anyone, Mr. Smith.

Q Except perhaps - -

A I would only have one thought about it and that is that the industrial operations of Oregon and Washington of the type to contribute to the war effort are now operating on some type of fuel.

Q Fuel oil, aren't they, mainly?

A That I do not know.

Q Well, that is the evidence, I believe, before this Commission.

A It is obvious they have some type of fuel and that the operations in Montana now and for the past 20 years have been operated by natural gas, and that they are all designed for the use of natural gas, and that a great many of the uses in the smelters at Butte and Great Falls are for metallurgical processes and those processes have been worked out on the basis of natural gas, so I think it is of some importance for them, of considerable importance to them, to be able to continue to operate the processes which have been developed through the years.

Q The situation is particularly this, that the Pacific Northwest including Vancouver and Victoria have no natural gas and Montana has some natural gas, and they both want and need additional natural gas. In the case of the Pacific Northwest they would need natural gas because

they have not any now, and you want some natural gas.

A I will agree with that general statement, yes.

Q And I take it from the material you have adduced here that the State of Montana is somewhat limited in its reserves, its proven reserves, of natural gas, quite limited?

A Quito limited, sir.

Q And your company has cash available for new construction and expansion, you have said, and you want to use this cash and extend your system and extend your markets, don't you?

A We want to use money which we have now raised to obtain additional reserves. Our wanting to extend our gas markets is affected to a great extent by the existing reserves available. We are a highly regulated company down there and when we consider extending our system we are always faced with the question of whether we may be required to extend our system, but we do not have any grandiose ideas of expansion. We survice a number of small towns.

Q You want to take care of your expanding markets?

A Yes.

Q Whether they are expanding or not, you forecast further growth?

A We have constant growth in the towns in which we now operate, and there are some other places of really small size in Montana where there is also growth and we might be interested in serving them.

Q Now, Mr. Corette, as I understand it, your 1949 total industrial consumption is 7,773,498,000, is that correct?

A From which table do you take that ?

Q I am taking that from Table - - excuse me for a moment until I find the table. I got that in one of the tables. I have marked the wrong one obviously.

MR. C.E. SMITH: If your figure is right Mr. Corette can probably find it for you.

THE CHAIRMAN: At the bottom of page 11.

Q MR. S.B. SMITH: Yes, that is where I got it from. Your total industrial consumption for 1949 was 7,773,498,000 cubic feet?

A That is correct.

(Go to page 59)

Q I find going to Table No. 8, it appears to me - just a moment, Table No. 1, I am sorry. Table No. 1 on your west line, Anaconda consumed last year 6,545,896,000 cubic feet? So that Anaconda - that is correct is it?

A Yes, that is correct, that is taking out the City of Anaconda.

Q Of course, the City of Anaconda is there because of the industrial activity?

A Its primary industry is the smelter, yes.

Q The smelter?

A Yes, the smelter that is there.

Q The smelter takes the bulk of that, or the manufacturing processes there.

A That is right.

Q So that of your total industrial consumption of 7,773,498,000 the great proportion of that is consumed by the Anaconda Company, is that correct?

A Yes.

Q So the Anaconda Company's consumption would be less than 6,545,896,000 cubic feet in 1949 because that includes the city, the domestic and every other kind of consumption at Anaconda?

A The Anaconda Company's consumption would be less than the 6,545,896,000 cubic feet.

Q Can you give us the figure for the consumption of the Anaconda Company for 1949?

A Yes, the total consumption of the Anaconda Company from our system in 1949 was approximately 7 billion cubic feet, and to that we would have to add the Anaconda Company's consumption at Great Falls, which we have just recently

started to serve, and it will be another two and a half billion, so that the total Anaconda consumption in 1951 we would expect to be approximately 9½ billion cubic feet.

Q And that is approximately the figure of 10 billion, at least, you use the figure of approximately 10 billion on Page 5 of your brief, and that is how you arrive at it, I suppose?

A That is right. Well, the 10 billion used on page 5 of the brief, the Anaconda Company consumption during the years of World War II at the three places, Butte, Anaconda and Great Falls, exceeded 10 billion slightly.

Q Now, are you anticipating an immediate increase in industrial consumption in Montana?

A We are not.

Q Well, I observe, for instance, from one of your Tables, that you take industrial consumption through Table No. 8 with no increase at all from 1951 to 1970, in your forecast?

A That is right.

Q Now, then, I would like to go back to your page 5, page 5 of your brief, where you say,

> "Anaconda Copper Mining Company uses approximately 10 billion cubic feet of gas per year. Unless additional gas supplies can be obtained, it will be necessary to curtail deliveries to Anaconda Copper Mining Company during the winter of 1951 and 1952, and, thereafter, which will seriously disrupt this important defence production."

Will you tell us why you anticipate that it will be necessary to curtail deliveries to Anaconda Copper Mining Company during the winters of 1951 and 1952?

A Yes. Because our Cutbank reserves have been supplying practically all of our requirements for the past 20 years, and there is a constant growth in our general public load, and our maximum day, a peak day load, has reached a point this year of where it is approximately equal to the total deliverability of our existing reserves. Our engineers estimate that next year, if we do not have additional reserves, that we won't be able to meet the peak day requirements, and that the large Anaconda industrial load would have to be curtailed. But it is more serious than that, we have reached the point in the use of our reserves where if we do not have extensive additional requirements, it would be necessary to hold for supply to the general public the greatest part of the reserves that we do have now, and to make a rather serious curtailment in Anaconda consumption. We have always recognized, as a matter of general policy, in our business, that if the reserves were such that we could not adequately serve both the general public and the industrial customers, that the reserves would have to be held for the general public; so that is the situation we face with the large industrial load.

Q Briefly, Mr. Corette, you have not got enough gas in Montana and you see some gas up here in Alberta, and you would like to supplement your supplies for Montana from the reserves in Alberta?

A That is a very good statement of our situation.

Q I do not suppose you would suggest that the Anaconda operations, if there is a shortage of gas for fuel there, could not be carried on by the use of oil or coal or other fuel? You would not suggest that? I am not talking about the economics of it. I am talking about the possibilities of carrying on.

A Well, that immediately brings into my mind many things, excluding economics, and from this point of economics whether the operation could be carried on with another and more expensive fuel, I do not know just where that point would be reached, all I do know is that the mining operations in Montana are very high cost operations, but these thoughts occurred to me, that if Anaconda had to convert its smelting and reduction operations to other fuels, that it would require a major reconstruction program in its plants which would use vitally important manpower. And I am quite familiar with the manpower situation in the area served by the Anaconda Corporation. All during the last war and extending up to this time, there has been a manpower shortage running from 1500 to 2000 men in the mines and smelters. During the last nine months a very extensive campaign has been carried on by the Anaconda Company throughout the entire Western part of the United States to recruit miners and smeltermen, and they had advertisements in all the newspapers, in all the important newspapers, I have been informed by the Vice-president in charge of the Western operations, and their shortage now stands at 700 men, so that if their operations had to be converted to some other kind of fuel, it would mean just the use of the manpower in the conversion

which manpower is vitally needed in connection with the production operations. In addition, it would mean the use of manpower and materials in the production of whatever other fuel was involved, and in the transportation of whatever fuel was involved. And the last thing, and perhaps the most important that occurs to me, is that the other fuel would probably be oil, and if we had a major war, the needs for fuel and gasoline for war purposes would be such that there would be a very vital conflict between the requirements of Anaconda Copper Mining Company and its Montana operations and the requirements of military forces for the same kind of fuel.

Q Of course, if we followed the same argument through to the Pacific Northwest, and that by reason of those operations it would increase the supply of oil to the Pacific Northwest, it might also have difficulties with regard to fuel, or they might also have difficulties in the Pacific Northwest with regard to fuel, is that correct, if you followed the same argument through?

A That is right.

Q So that really what you are suggesting is, in fact, that you take a substantial quantity of gas from Alberta largely for the purposes of looking after the requirements of the Anaconda Copper Company in Montana?

A No, I do not believe that is what has been suggested.

Q That is about what it adds up to?

A Pardon?

Q That is about what it adds up to? You say that your domestic consumer policy is that they are not going to go short of gas, you are going to look after them; if

you have got to reduce the consumption of somebody you would have to reduce the requirements of Anaconda Copper Company?

A Yes, I think we would be required to.

Q So that you would need more gas from Alberta in order to supply what Anaconda Copper Company needs in Montana, that is the sum and substance of it, isn't it?

A Yes, it is a fact that we need more gas to carry on our general gas business in Montana.

Q I suppose if the Portland Gas Company and the Seattle Gas Company and the Spokane Gas Company, and other companies, from the Pacific Northwest, came here, and they are all vendors of manufactured gas, and put their bid in to have natural gas, they would be in the same position as your company, except that you are in the natural gas business, and you are anxious to get more gas?

A We are anxious to get more gas.

Q Yes?

A If we had in our system enough to have gas for our general public load, without the industrial load, we still would not be in a position of having too much gas at the present time, as you will see from the information which will be submitted by Dr. Perry as to our reserves,

Q So, as Mr. Martland, I think, has suggested to you, what you are putting forward before this Commission is that there should first be export of Alberta gas to Montana before natural gas from Alberta is provided for the purposes of any Canadians outside of Alberta?

A I do not believe that we are suggesting that, Mr.Smith.

Q Well, that might be? If yours were the only application

granted, that would be the result,wouldn't it?

A I am not sufficiently well informed to say that.

Q I see.

A If ours was the only application granted, I suppose it is obvious that no other gas would be exported from Alberta?

Q Yes.

A But I do not know enough about the situation to know that ours interferes with any other particular applicant.

Q All right, thank you.

.....

EXAMINATION BY MR. C. E. SMITH:

Q Mr. Corette, I wonder if you would refer to page 1 of your submission, Exhibit 2, that is the page where you deal generally with your proposed Exhibit 2?

A Yes.

Q Mr. Corette, referring to this particular paragraph, about the middle of the page,

> "In addition, the Parliament of Canada is being petitioned to incorporate a pipe line company under the name of 'Canadian-Montana Pipe Line Company', to own and operate the gas transmission lines which will be necessary to transmit the gas from the Pakowki Lake area to the Canadian-Montana border, if the export permit being applied for is issued."

I wonder, would you expand for me, for my information, a little on, probably, the reason for petitioning Parliament for this company under the name of Canadian-Montana Pipe Line Company?

A Yes. Originally, when we became interested in acquiring gas reserves in Canada we inquired as to whether it would be necessary for us to have a Dominion company or an Alberta company, and our information at that time was that all we would require would be an Alberta company, and Canadian-Montana Gas Company Limited was then incorporated, with the thought that it would, if this export permit were granted, own the field and the transmission line to the Canadian border. Subsequently, we were informed by people whom we contacted, who were familiar with Dominion policies, that the Dominion probably would not issue an export permit to any company other than one incorporated by the Dominion by Act of Parliament; and, consequently, we decided that we should petition Parliament to incorporate a pipe line company which would be the holder of the export permit, if granted, so that we had no choice of having two companies, we would much prefer having one company, if that was in accordance with the laws.

Q To be quite frank with you, I wonder why your Canadian-Montana Gas Company Limited could not do everything that is required insofar as your people are concerned?

A Well, that came about entirely by reason of inquiries that we had made of people in the Dominion Government, and we were informed that they did not believe that the Dominion would grant an export permit unless we had a company which had been incorporated by Parliament.

Q I can put it this way: It is a matter of tactics, I suppose, rather than legal necessity, would that describe it?

A I really do not know. It seemed to be the only course

that we could follow, Mr. Smith. If that was required, we were perfectly willing to meet all the requirements that were required.

Q You might be quite right. I wondered why you had?

A That is the reason.

Q What appeared to me was that an export company could not expect to have it, having regard to what you had in mind, perhaps, but apparently somebody has advised you that a company would be better off in front of some Dominion body if you had a Dominion incorporated company?

A No. The advice did not come to me in that way. It came in this way, that the Government, the Dominion Government probably would not issue an export permit to a company unless it was chartered under the laws of the Dominion.

Q I see?

A It came to me purely as a legal matter, and under the laws of the Dominion Government, the Dominion Government would not issue a charter unless that was done.

Q I see?

A We would much prefer one company. Our whole history has been one of a simplified corporate organization instead of multiplying them, and Montana Power Company has now no subsidiaries.

Q I see. It is a matter of tactics with respect to some export permit by the Dominion Government that you have been advised that such an application should be made by a Dominion Company, is that the idea?

A No, it is not. I was not advised it was a matter of tactics at all, just a matter of law.

Q Oh, a matter of law? Well, I will leave it there.

MR. MAHAFFY: Mr. Chairman, if I might ask one or two questions of the witness, please?

THE CHAIRMAN: Yes.

.....

CROSS-EXAMINATION BY MR. MAHAFFY:

Q Who is it that supplies the City of Great Falls with natural gas now, Mr. Corette?

A In the City of Great Falls the distribution system is owned and operated by a small independent company called The Great Falls Gas Company, and it buys its gas at the edge of the city from the Montana-Dakota Utilities Company.

Q And is the supplier separate and apart from your company?

A That is correct.

Q And were they previously supplying the Anaconda plant near Great Falls?

A The Montana-Dakota Utility Company was previously supplying the Anaconda plant near Great Falls.

Q And you have taken on that additional load in the past few months, is that right?

A Yes.

Q And where is the source of gas for the Great Falls Utility, that is, what gas field, from whence does it come?

A The Montana-Dakota Utilities Company takes gas from the Cutbank field, from the Kevin field, and from some small fields east of the Kevin field in Montana.

Q Is it the company that is referred to in Mr. Perry's brief that is now building a new transmission line from Wyoming?

A That is correct, but the new line from Wyoming does not go near the Great Falls area, it is for an entirely different

part of their system. It goes from Wyoming across the southeastern part of Montana, up to the Montana-North Dakota line,and into North Dakota, so that so far as I know, it is not in any way connected with the part of Montana which is served by Montana-Dakota, and our company in the Great Falls area.

Q Well, now, Mr. Corette, you have explained that you would like to obtain gas on the Canadian side from a particular field, namely, the Pakowki area, is that right?

A Yes.

Q Assuming that a system of gathering gas that is sometimes called a grid system were established on this side of the line, would it serve your purposes to purchase gas from such a system?

A Yes. From the standpoint of our purposes, it would be of no importance to us whether the gas came from a particular field or a grid system, but from the standpoint of what I would conceive our obligations to be now, we have had very pleasant and very satisfactory dealings with McColl-Frontenac Limited and Union Oil Company of California through our connections with them and our dealings with them, and we have a very high regard for the men in those companies, and we have a contract obligation which we would feel morally and legally bound to carry out, if approved by the Board, and if approved by the Government of Alberta and of the Dominion.

Q But if the Board did not approve of this application, then you would be free to deal with any Alberta gas from whatever source you wish to obtain it, is that right?

A I believe ao.

Q And you would be interested in that case in tying the gas on this line, would you?

A Yes, we would very much. I think the presentation would show that we need gas and we would like to buy it in this general area if possible, because this area from a standpoint of production is so close to our Cutbank field in our North end and our 20-inch line, that it is almost ideally situated for the supply of gas for the Montana Power Company system.

Q "ould it seem to you as a purchaser of gas for retail consumption, Mr. Corette, that it might be an advantage to be connected to a system, a gathering system which was in turn connected with various fields?

A I would see not much advantage in it, no.

Q Is there any advantage in security of supply being connected with several fields rather than just one?

A Well, I think it would depend entirely on the connected load to that system and on the reserves behind that system.

Q Quite?

A And on the way the system was operated?

Q Yes.

Q Either with the individually owned fields or with the over-all connected network that had adequate reserves behind it and adequate deliverability, then I would not see any particular advantage to being connected to a large individual system.

Q A multiple system?

A No.

Q I see. Now, when you took on the additional Anaconda

load within the last few months, did you feel that you had adequate reserves to take on that additional load?

A No. We were not very happy about it, and neither was the Anaconda Company.

Q I see?

A But the Anaconda Company in 1948 had a contract with the Montana-Dakota Utilities Company expire and the best contract that Montana-Dakota Utilities Company felt it could give to the Anaconda Company, in the light of Montana-Dakota reserves was a two-year interruptible contract which expired on November 15th, 1950.

Q Yes?

A During the period of two years the interruptions were somewhat frequent in times when the weather was not too severe.

Q Yes?

A And Anaconda Company was not very well satisfied with its supplier, and it was not much better satisfied with our reserve situation either, but it felt that because of its long association with us and the more satisfactory dealings that it had with us, that we would make every effort to supply their total requirement and would rather have a contract with us than with the Montana-Dakota Utilities Company.

Q Thanks very much.

MR. S. B. SMITH : Could I ask a question or two arising out of that, Mr.Chairman?

THE CHAIRMAN: Yes.

.....

CROSS-EXAMINATIONYBY MR. S. B. SMITH:

Q Are there conditions in that contract relieving you if you are not able to supply, or are there some conditions or provisions with regard to the interruptible load? There must be?

A In the contract with the Great Falls smelter, with regard to the Great Falls smelter load, there was the ordinary provision and certain general provisions relieving us in the event of depletion of reserves, but in the other contracts we have with Anaconda at Butte and Anaconda, those provisions in the contract are not as binding as the one at Great Falls.

Q The contract is not?

A No.

Q I see. Were you in competition with the Montana-Dakota Utilities Company in endeavouring to get the supplies or reserves in Wyoming, which they finally succeeded in getting?

A We definitely were.

Q And as the result of their acquiring them they have built a 340-mile pipe line worth some millions of dollars, and if you had succeeded in getting that gas you would not be up here trying to get Alberta gas now, is that right?

A I think that is probably true. The reserves there are substantially the same size as the reserves in the Palowki Lake area as estimated by Dr. Beach.

Q So that you lost out, unfortunately, in competition with the Montana-Dakota Utilities Company, and you are now looking north?

A Yes, that is correct. When I think back on the negotiations

I do not think we ever had a chance, and I think that the Montana Utilities Company had the reserves pretty well tied up before we went into the picture. I think if we had got those reserves you might have found the Montana-Dakota Utilities Company up here instead of the Montana Power Company.

THE CHAIRMAN: Mr. Corette, relative to the questions Mr.Smith asked you, I would like you to be clear on this matter of petitioning the Parliament of Canada. That is, you have petitioned the Parliament of Canada and you have had an Act passed incorporating the company under The Pipe Lines Act?

A Yes.

Q And, therefore, you would have to obtain a permit from the Board of Transport Commissioners to build a line, was that your understanding?

A Yes. And my understanding, Mr. McKinnon, was based entirely on what Mr. Macleod informed us the requirements would probably be. I made no independent study of Canadian laws or what might be required in that way.

Q So that you would be required to get a permit from the Board of Transport Commissioners and then a permit as well for export from the Federal Government? Possibly Mr. Macleod might assist you in that, if you wish?

MR.MACLEOD: I understand, sir, that we would be required to get a pipe line permit from the Dominion Government, and also an export permit. We were informed that the Dominion Government would not consider any applications except from Dominion companies incorporated by private Act owing to the difficulty which arose in a

recent session, where they considered allowing incorporation under a general Act. I do not think there is any law under it, but the policy was, the policy that they had adopted, would require other applicants to come in as Dominion incorporated companies.

THE CHAIRMAN: Would that necessitate them then going to the Board of Transport Commissioners?

MR.MACLEOD: I think we would have to go anyway.

MR. C. E. SMITH: Why?

MR.MACLEOD: Under the Act.

Q THE CHAIRMAN: Mr.Corette, there is just one other thing. On Page 13 you say that you wish to emphasize that this application is for a permit to export to Montana all of the reserves in the four fields named in this application. And then you qualified that later by saying if there was any local requirement in Alberta, that you would be prepared to serve the local communities with gas, is that correct?

A That is correct. But my understanding of that, sir, down there, is that the population is very limited, and that the requirements there, if any, would not be large enough to be of consequence in connection with this amount of gas.

Q You are aware of the provisions of the Act whereby the Board, if there were any emergency, can direct that that gas be made available, and also under our own Conservation Act, that we can direct where gas must be transmitted to if we so desire?

A We understood that your Board had practically complete control, sir, over everything that went on in the gas

operations.

Q Mr. Corette, I wonder if you will be available tomorrow? We have not really had an opportunity of studying this in detail. You have made some changes in it, and we would like to have you available tomorrow for further examination?

A I would be very glad to be here tomorrow, sir.

Q That will be all just now, thank you, Mr. Corette.

A Thank you.

(Go to Page 76)

MR. MACLEOD: Mr. Chairman, my next witness is Dr. Eugene S. Perry.

THE CHAIRMAN: Before we call mr. Perry, I presume Mr. Dodge will be available to present this revision?

MR. MACLEOD: Yes. My reason in calling Mr. Perry is because he has prepared the technical evidence in support of the general evidence given by Mr. Corette, as to gas reserves in Montana.

EUGENE S. PERRY, having been duly sworn, examined by Mr. Macleod, testified as follows:

Q Mr. Perry, will you tell the Board something about your education and professional qualifications and experience?

A I was born in the State of Illinois in 1892. I attended the University of Kentucky where I received a Bachelor of Science degree and a Doctor of Science degree in the field of geology. I attended the University of Chicago where I received a Doctor of Philosophy degree in the field of geology. I have done field work for the Tennessee Geological Survey, the Kentucky Geological survey and the Oklahoma Geological Survey. I have worked for private oil companies in the State of Oklahoma. I have taught school at the University of Kentucky for a period of five years. I have taught school at the Mexico School of Mines. I have been at the Montana School of Mines in the capacity of head of the Department of Geology for 23 years. I have been Chief Geologist for the State of Montana for 20 years. Is that adequate?

THE CHAIRMAN: I think that is quite sufficient.

Q MR. MACLEOD: You have prepared a presentation,

Dr. Perry, with regard to the natural gas reserves in Montana and would you be good enough to read it?

THE CHAIRMAN: We might give that a number, Mr. Macleod. It will be Exhibit 5.

SUBMISSION BY DR. EUGENE S. PERRY AS TO THE NATURAL GAS RESERVES IN MONTANA NOW MARKED EXHIBIT 5.

A NATURAL GAS RESERVES IN MONTANA

In my capacity as chairman of the Department of Geology at Montana School of Mines, I have had opportunity during the past 23 years to become thoroughly familiar with the occurrences of oil and gas in the State of Montana. During this time I have made a number of reports on the gas fields of the State. Recently in co-operation with engineers of Union Oil Company and The Montana Power Company, I have prepared an estimate of the reserves of natural gas in the State of Montana as of January 1st, 1950, and the results of this study are shown in Table I, attached hereto. This table includes all of the producing fields, together with the single wells and small areas of gas occurrences for which sufficient data is available to make a reliable reserve estimate. This table also shows the date of discovery and the initial production and pressures, the number of producing wells, the cumulative production to January 1st, 1950, and the latest available pressure data. It will be noted that approximately half of the gas reserves discovered to date have already been withdrawn.

Table I shows a total of 633 billion cubic feet of future gas production. It should be noted that this figure represents recoverable gas and not the amount of

marketable gas. No attempt has been made to show deliverability from the several fields due to the paucity of data on sustained delivery rates.

The United States Bureau of Mines Publication, "Minerals Year Book on Natural Gas" for the year 1949, shows a total "non-associated" or dry gas reserve for the State of Montana of 767 billion cubic feet. No breakdown of this figure is published, and I have been unable to relate this total to the total of 633 billion cubic feet shown on Table I. It is known that the Bureau of Mines' figure is a compilation of individual estimates furnished by a considerable number of operators and/or private individuals interested in the several gas occurrences and that the Bureau of Mines acts only as a compiler without opportunity to check the accuracy of the figures submitted by the interested parties.

In the absence of a breakdown of the 767 billion figure, I am unable to explain in what fields the discrepancies exist or the reasons therefor, other than that data used by the Bureau may have been inaccurate in some cases.

No dry gas in commercial quantities is known to me other than the reserves shown in Table I, and there is in this table the portion of these reserves available to The Montana Power Company.

Another large gas utility company in the State recently has expended in excess of $8,000,000 in construction of a 340-mile pipe line into Wyoming to obtain additional gas supplies. It is my belief that this fact is further evidence that no reserves of gas, other than those shown

in Table I, are available or in fact exist within the State of Montana.

In addition to the reserve estimates, I have prepared a map of the State of Montana, in color, representing my conclusions as to the possibility of gas production in the several portions of the State.

MR. MACLEOD: Mr. Chairman, I have only 10 copies of that map available. They are contained in the presentation which has been handed to the Board. But we have not them for everybody. Might I put this upon the board?

THE CHAIRMAN: Yes. Possibly we had better give it a number, seeing there are not sufficient copies to go around.

MAP IN QUESTION NOW
MARKED EXHIBIT 6.

A The entire western portion of the State, colored dark brown, has been classified as a region in which the discovery of gas is considered highly improbable, due to the nature of the rocks and absence of favorable conditions therein. The pale brown regions have been characterized as areas in which the possible discovery of gas is thought to be very unlikely, for similar reasons.

The large area in the eastern portion of the State, colored blue, has been characterized as discouraging for further exploration, due to the fact that a number of major oil companies and independent operators have carried on most extensive surface geologic studies, geophysical exploration and have drilled upon those structures which were considered favorable, without the discovery of any

producing oil or gas fields other than those shown in red on the map. Reserves have been calculated for these fields and are shown on Table I. Exploration wells in Montana are shown on the map. The central portion of the State, colored yellow, is a region in which the geologic formations and structures are favorable for the accumulation of oil and gas. In this region, some hundreds of wells have been drilled at the locations shown, without the discovery of any additional gas fields or gas wells, other than those shown in red and for which reserves have been calculated in Table I.

It is therefore my conclusion that while relatively small areas of gas production may be developed in the future, particularly in the Sweetgrass Hills area, no new large fields comparable to the Kevin-Sunburst Field or Cut Bank Field will be developed. It is further my conclusion that the reserves shown in Table I represent substantially all of the potential future gas production available to gas distribution companies in the State of Montana, and that these utilities must look to importation of gas from outside the State to supply the future needs of their customers.

MR. MACLEOD: Perhaps, Dr. Perry, you might go over this Table I and point out anything you wish to, particularly?

A Table I involves a rather long list of what appears to be gas fields or producing areas and that list is more imposing than the situation really is. I have included in this list many small areas in order to make the table comprehensive, for one reason, and also because the United States Bureau of Mines, in their lists of gas fields of Montana, include

the names that are listed on this sheet and this sheet includes the names that are listed in the Bureau of Mines.

Now, then, in the upper portion of the sheet is a line drawn across the page, which separates the Cut Bank fields from the list of the State as an entirety. The total Cut Bank field is listed just below this line. Now that information given above the line breaks the Cut Bank field into its various component units and shows the detailed information pertaining to those units. The reason of that particular breakdown and the reason I did for that particular field and not other fields was that The Montana Power Company supplied me with the information which I could not get from the other operating companies.

(Go to page 82.)

A Now, going on down the sheet the information that is pertinent, of course, there is the date of beginning and as one glances down the dates for the major fields, which are really the first half a dozen, dozen items, in the list, the age of those fields range from 25 years down to perhaps 10 years. 20 years is a good average figure for the period of production. The number of wells listed in the second column, some fields, for instance, Bowdein field, 310 wells in the one field. The average initial pressures, as pressures go in gas fields, with the exception of Dry Creek and Clarks Fork, are not big pressures. The initial pressures, as gas fields go, are not particularly large. The average 1950 well head pressure, which is the fourth column over, shows the straggling decline that has occurred. And you will note that a field, Devon field, at 70 pounds pressure, which does indeed show the stress. A little field further down, about the middle of the page, Hardin field, I do not know the pressure. I am satisfied it is closer to 50 pounds than it is to 75. I believe possibly it is less than 50 pounds but I could not get that information. Going down that same list, Kicking Horse field, abandoned because of low pressure; Bow and Arrow field abandoned because of low pressure; Marias River field abandoned after two years, it was just a puff of gas and then it was gone. Going on to the next column, total withdrawals in 1950, I think it is self-explanatory there that the annual withdrawal and finally the estimated reserve as of the beginning of 1950,

and of which you will see immediately that the Cutbank field is the outstanding reserve in the State, and next to that is the Bowdein down about seven or eight items.

Q The last column?

A The last column shows that part of the reserves that are available, and starting at the top of the column available to the Montana Power Company, and further on down to the Montana-Dakota system, and then there are a few remarks pertaining to isolated or abandoned and so forth, but the importance of that column is that it shows the distribution of our gas reserves.

CROSS-EXAMINATION BY MR. NOLAN:

Q I might ask Dr. Perry a question, if I may, please. Dr. Perry, the large gas utility company that has recently expended a sum in excess of $2,000,000.00, is that the Montana Dakota Company?

A Yes. That is Montana Dakota Utilities Company, and I believe the application that was submitted before the Federal Power Commission included also the Montana-Wyoming Gas Pipe Line Company.

Q Well, so far as the Montana Power Company is concerned, we have been told by Mr. Corette that where they got their supply - - Mr. Corette said from the Cutbank field and from the Dry Creek field.

A Essentially so.

Q Yes, essentially. Now, do I understand the Montana-Dakota, that they draw their supplies from certain of these Montana

fields and also Wyoming by reason of this expansion?

A No Wyoming goes to the Montana-Dakota line prior to 1950.

Q Prior to 1950. I want to ask you this, does the Montana-Dakota Utility system serve the State of Dakota too?

A They have pipe lines extending into both North and South Dakota serving towns, I do not know the complete list, Williston, and I believe they go to Bismarck, Rapid City.

Q So some of the gas that is produced in the State of Montana is exported into the State of Dakota, North and South?

A That is right, and has been for several years.

Q Yes, I see. Thanks very much.

A I can get figures on those if you care for them.

Q MR. MACLEOD: Perhaps it might be of benefit, Dr. Perry, if you were to just tell us where that Wyoming field was, roughly?

A I can point this out on the map. On the map is the word "Elk Basin field" and just below it "Clarks Fork field". The Worland field is some several miles from, I think about 30 miles, southeasterly from these fields. The new pipe line will cut across a portion of Wyoming and diagonally a little more east and northeast and join with the Montana-Dakota Utilities line in the eastern part of the State. That line then in approximate figures will be some four or five hundred miles from Montana.

Q And does it go on?

A It joins the system of the Montana-Dakota Utilities and from there on, I presume, will spread throughout their

system, that is, the gas will spread.

Q And these two larger areas coloured red in the blue portion are Montana-Dakota?

A Yes, sir. The most easterly one is the Baker-Glendive field, which is a Montana-Dakota owned property, and the northerly one is the Bowdein-Sacco field, also operated by the Montana-Dakota Utility.

MR. MARTLAND: I have no questions, sir.

EXAMINATION BY DR. GOVIER:

Q Dr. Perry, I wonder if I might ask two or three questions. On page 1 you refer to, about two-thirds of the way down the first paragraph,

> "and small areas of gas occurrences for which sufficient data is available to make a reliable reserve estimate."

I think it might be very helpful to the Board, Dr. Perry, if you could tell us what in your opinion constitutes sufficient data to make a reliable reserve estimate?

A I should desire to know the initial pressure, the open flow volume, information concerning the character of the producing sand, and if the well had been drawn upon I would definitely want to know the amount of withdrawals and the decline in pressure.

Q What information would you look for regarding areal extent of the field?

A I am not sure that I quite understand your question. Wherein we have a 1-well field out in the open prairie, how would I arrive at my conclusion, is that your question?

Q Well, if you were to answer that question it would answer what I had in mind very nicely.

A The common practice with a 1-well field in the open prairie is to draw a 1-mile circle around it.

Q Is that what you did, for example, at Clarks Fork?

A The Clarks Fork information I received from the engineers of the Montana Power Company and I do not believe that they extended that as far as a mile, although I am not sure just how they calculated it. That well is very recent and I have not had an opportunity to get detailed information from other sources.

Q Generally speaking, Dr. Perry, would you be in agreement with the idea of assigning some arbitrary acreage such as 2,000 acres or a figure near that to an isolated 1-well field? Do you think that is a reasonable acreage?

A It would depend so much on the geology of the area. In regions of Bow Island sand it could go wrong very easily because the sands may pinch out before you get a mile away. It would depend entirely upon the locality and the geology of the locality that you are considering.

Q Do you believe on the average for areas of the type of Montana and Alberta the 1-mile circle would be a reasonable figure?

A I think it is about the only method of approach where you have no data. It is about the only method of approach. You have got to know if they will drill another well on the edge of the circle.

Q There is another matter, Dr. Perry, that I thought you

might help us on. Your State apparently has had some experience with the abandoning of fields, experience which fortunately we have not yet had. Can you give us any thoughts concerning likely abandonment pressures for Lower Cretaceous sands, Viking sands and so on?

A The abandonment pressure depends so much on the local economic factors that I do not believe one - - I would not be capable of picking out a field without knowing about the factors involved. However, I would call attention to the Devon field with 70 pounds in there producing this year. I would call attention to the Hardin area. While the pressure is only given as low on the sheet, I am satisfied that it is much less than 100 pounds, I think probably in the order of 50 pounds, and they have produced.

Q What are the depths of those wells?

A In the Hardin field?

Q In both the Devon and the Hardin?

A Oh, the Devon field - -

Q Just in round figures?

A I would have to go to my notes. They are under 1,000 feet, considerably under 1,000 feet.

Q And what sand are they producing in?

A Well, Devon is producing from the - - I do not find it in my notes but I believe it is the Bow Island sand.

Q And what about the Hardin?

A Hardin is producing from what geologists call stray sands that are about the middle of the Colorado formation.

Eugene S. Perry,
Exam. by Dr. Govier.

Q Do you have an idea of the depth there?

A It is relatively shallow, somewhere in the order of 600 or 700 feet.

Q Are there any others in this list that might be a guide to us in abandonment pressures, some of those others that are now abandoned, being abandoned at figures that you can quote to us?

A In the Baker-Glendive field there are two sands, an upper one which occurs about 700 feet, known as the Judith River sand, which at an initial of 220 pounds - - I am reading from a table - - and the present pressures are in the neighbourhood of 75 pounds. Now, the Baker-Glendive field is a long one, some 30 or 40 miles long, and the pressures are not the same in all parts of the field and this figure of 75 is the closest reasonable average I can get for that as an overall figure.

(Go to page 89)

Q Yes?

A Now, they are producing from that field at the present time. The second figure in that Baker-Glendive field is the actual sandstone some two or three hundred feet below the Judith River sand, and that is a much smaller portion of the producing area of the Baker-Glendive field. The wells in that sand are characteristically small producers, one-half million plus or minus, sometimes considerably minus. The fact that they are producing half million wells with from 250 to 400 pounds pressure and the fact that they are producing other wells in their main sand which shows a pressure of about 75 pounds, certainly indicates distress to me.

Q When you say they are producing half million wells, you mean half million open flow wells?

A Half million cubic feet per day.

Q Open flow?

A Open flow.

Q Not the producing rate?

A That is the open flow.

Q Or are they the same?

A That is the open flow.

Q And these wells are producing at their open flow, are they?

A Well, the Montana-Dakota Utilities Company does not tell me whether they are or not. I presume that they are not if they are carrying on.

Q These figures represent the daily open flow of the well?

A Those are figures that I got from reports from the U.S. Bureau of Mines, the Geological Surveys, and various sources

that I have been able to get as to the behaviour of the wells at the time that they were drilled. They are small wells.

Q Have you any further comments on the subject of abandonment pressure, Dr. Perry? I suppose you had to make an estimate of the producible portion of the reserves of gas area which you have here? No doubt abandonment pressure would enter into your calculations, what you would choose as an average figure?

A It would depend upon the depth of the well and the operating conditions. Personally, I think that perhaps Cutbank might go a little below 100, maybe they could go as low as 75, but I do not think on the information that I could make a reliable estimate on that.

Q Generally speaking, would you be inclined to use figures that would range from 75 to 150 pounds, depending on local conditions, would it be in about that range?

A I think that would ne a better way of calculating it rather than just take 100 pounds as the over-all figure.

Q Thanks very much.

Q MR. GOODALL: Dr. Perry, you have been in Montana for a considerable time, haven't you?

A Yes.

Q Would you go back in memory and give us some idea of what your reserves would have been, say, about 20 years ago, how they held up during the years?

A In 1935 I wrote a 96-page report on the natural gas fields of Montana. I did not state the reserves at that time for various reasons. You will find in this book some statements which are rather optimistic. I think that if I

was rewriting this book since 15 years ago, that I might have shown those statements a litttle downwards. That is, in view of what has happened. With regard to the optimistic statements, of course, I did not take into consideration any expansions in markets that have come in, and the amount of gas that had been produced at the time this book was written was not enough to permit pipe lines to Minneapolis and Seattle, which they wanted to do, but, in my judgment, it was adequate for Montana for 20 or 30 years, and, of course, they are proving to be adequate for 20 or 30 years, taking the beginning time from when this book was written.

Q Have you any particular fields which have held up on their reserve estimates? I might say, for instance, the Kevin-Sunburst field?

A There was no reserve estimates, and there are no data that makes possible the reserve estimates in this report. Intentionally so.

Q Well, I was just wondering with regard to our reserve estimates that we are getting now,on our Alberta reserves, if they might not be optimistic?

A Do you refer to the ones in Alberta?

Q Yes?

A I would be inclined to think that the estimates are substantially correct, because, and I am not a gas engineer, I am a geologist, the reserves calculated in Alberta were done by men whomI consider to be some of the very best men.in the field.

Q Yes?

A And I would consider that their estimates are substantially

correct within the limits of the area they were working. I do not believe that they can predict new wells that may or may not be drilled beyond the limits of their area.

Q Thank you, Mr. Perry.

Q THE CHAIRMAN: Dr. Perry, would you be prepared to say this, that your original optimism when youwent there and made this report in 1935 was not justified on the basis of the information, the geological information that you had at that time?

A The optimistic estimates I made may not have included a long enough time for Montana.

Q It was not on the basis of the disappointment of discovery? We have had a lot of evidence before this Board on geological information as to the prospects of finding gas, and the reason I am asking you this question is, I want to get your idea of what the situation was when you made this report, and whether the strikes or finds of gas that you thought might take place did take place?

A Well, this report was written at a time when several of our larger gas fields were just being brought in. At that time almost every extension they drilled was a good well. Since this report was written they have bordered the fields with dry wells. I think, perhaps, I was influenced by the great number of new wells that came in just at the time that I was writing the report.

Q This map that you have presented to us, was this a map that was available, and were those divisions made, at the time?

A This is the first time this map has ever been on exhibit in any place.

Q So that this represents a map based on your knowledge now, but you had not prepared this map at the time of your report?

A This map was prepared, and the colour bands on there have been placed on it, within the last month.

Q Thanks very much, Doctor.

MR. MACLEOD: Will the Board require Dr. Perry any further?

THE CHAIRMAN: No.

MR. MACLEOD: There is no more cross-examination?

THE CHAIRMAN: No, I do not think so.

MR. MACLEOD: Dr. Perry might want to go tomorrow.

THE CHAIRMAN: Unless any of the other Counsel wish to examine him. I think they have all had an opportunity to cross-examine him, and as far as we are concerned, we have no further cross-examination. I think we might now adjourn until tomorrow morning, Mr. Macleod.

MR. MACLEOD: Yes.

(Hearing adjourned until 9.30 a.m. December 5th, 1950).

:::::::::